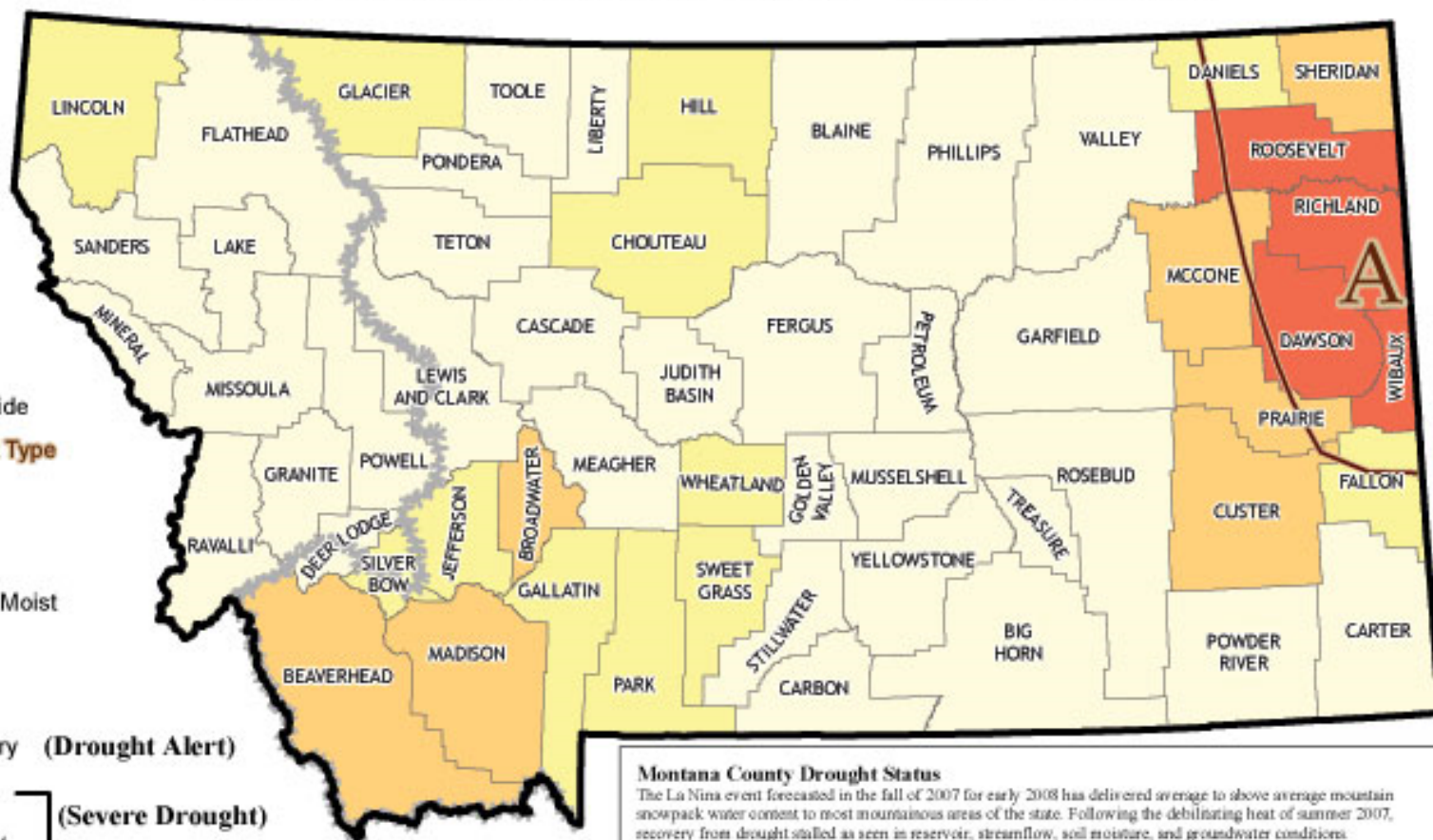


Montana Drought Status by County - September, 2008



Drought Alert - Governor's Drought Advisory Committee strongly encourages local officials to convene local drought committees,

Severe Drought - Local officials should have local drought planning efforts underway or should reconvene the local drought committee at the earliest opportunity.

For recommended responses, see the Montana Drought Plan.

Drought Alert - Governor's Drought Advisory Committee strongly encourages watershed groups and county drought committees to convene and undertake planning for drought.

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For information about how the drought status maps are determined or to learn more about recommended responses to drought see the Montana Drought Response Plan.



<http://nris.mt.gov/drought/>



<http://drought.mt.gov/>

Montana County Drought Status

The La Nina event forecasted in the fall of 2007 for early 2008 has delivered average to above average mountain snowpack water content to most mountainous areas of the state. Following the debilitating heat of summer 2007, recovery from drought stalled as seen in reservoir, streamflow, soil moisture, and groundwater conditions.

The plains areas of the state remain essentially where they were at the end of the 2007 growing season - dry with little snow cover. The period from December through March brings only about two to three inches in a normal year to plains and valley elevations and spring storms will be important to recovery in these areas. But the water supply outlook looks very favorable as of mid-February for surface water dependent valleys on both sides of the Continental Divide as the mountains reach the two-third mark of the snow water accumulation period for the water year. The concern at this time is whether the state will experience an early snowmelt of mountain snowpack, as in 2007, or a normal runoff period from mid-May through June.

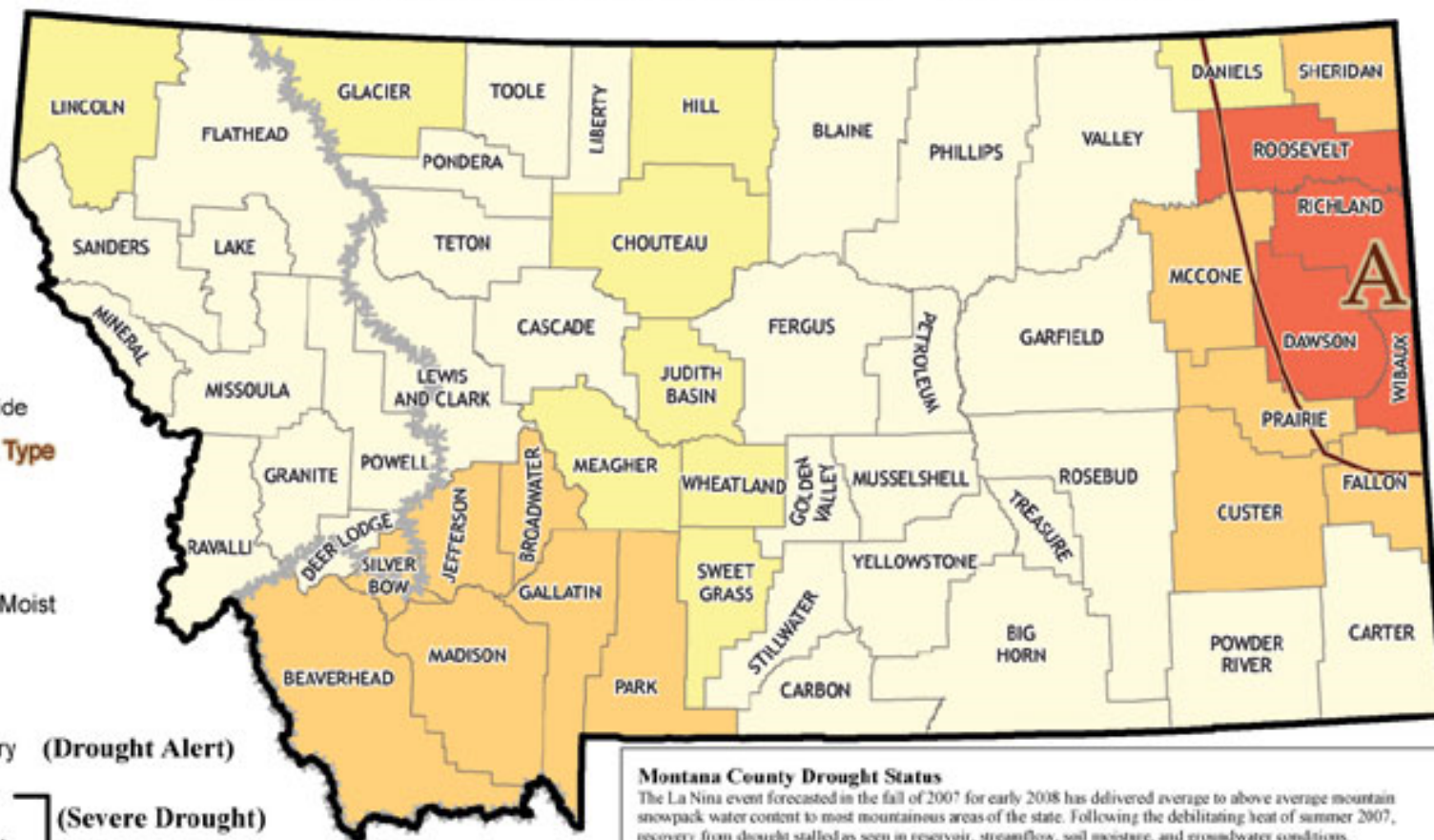
The Governor's Drought Advisory Committee assesses water supply and moisture conditions on a monthly basis to determine drought status for each county of the state. The drought status map is used primarily to promote awareness of drought and to alert Montanans to impending drought conditions so they may respond appropriately.

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Montana Drought Status by County - October, 2008



Montana County Drought Status

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Governor's Drought Advisory Committee Meeting

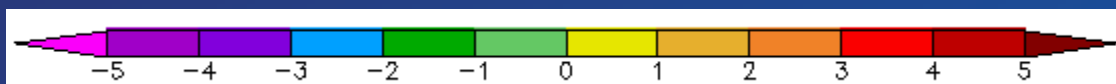
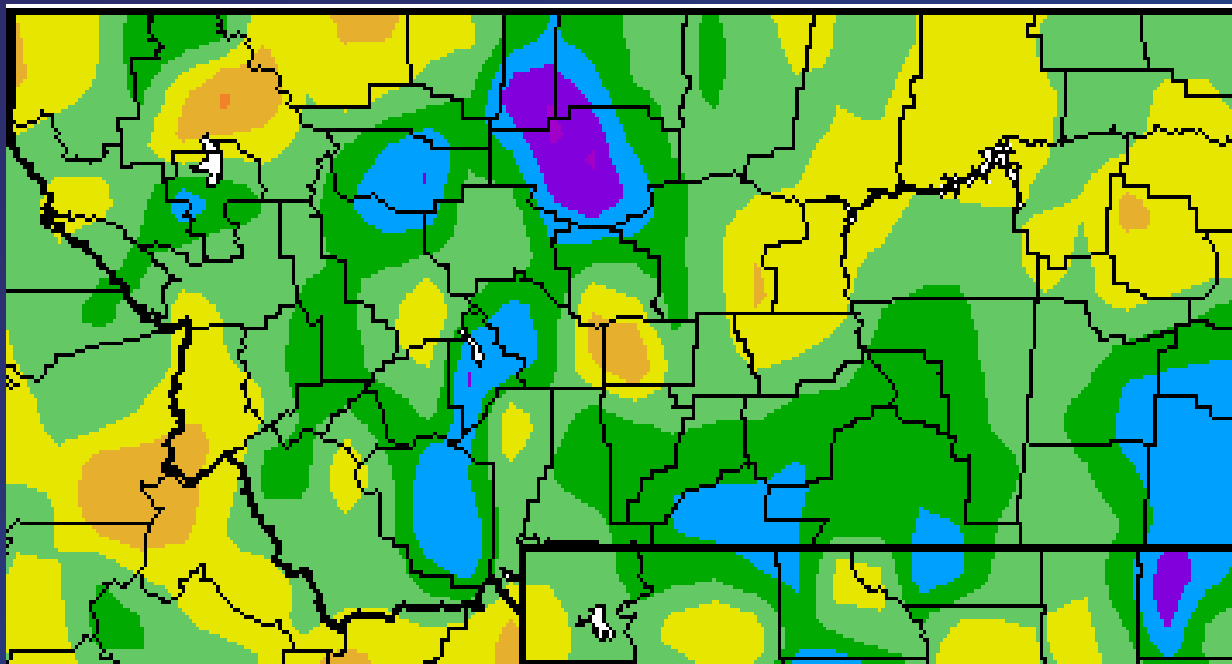
October 15, 2008

National Weather Service

Gina Loss

Temperature Anomalies

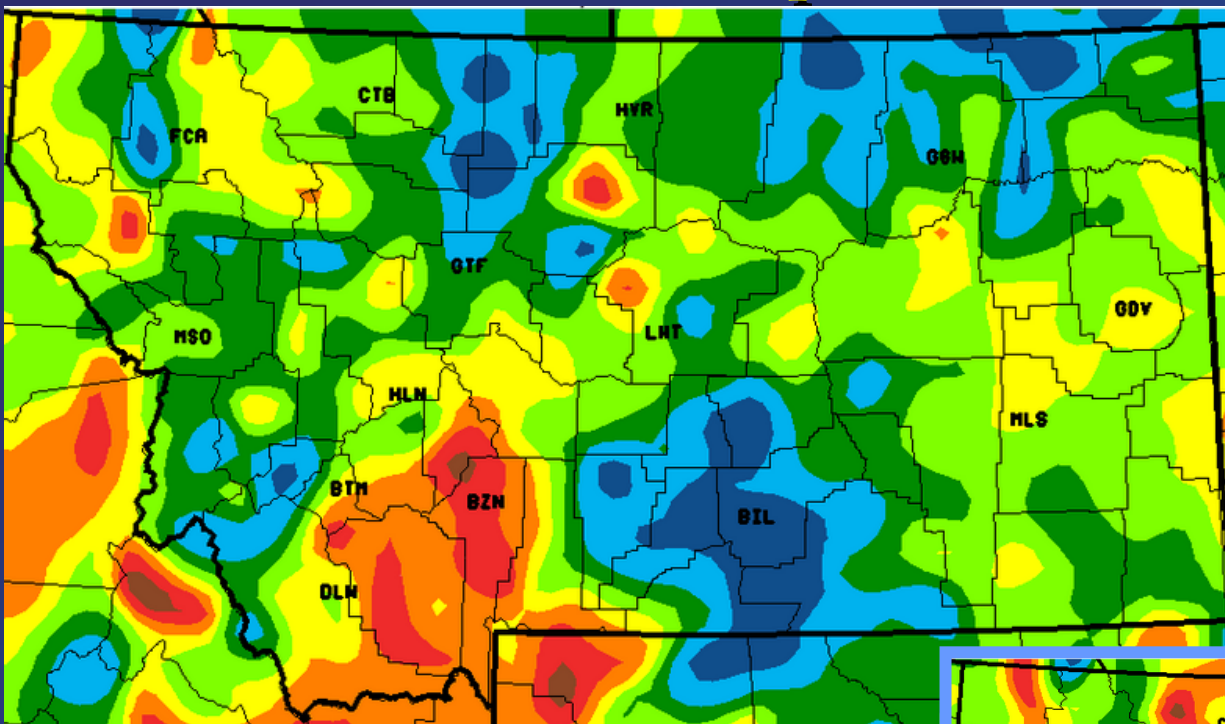
September 2008



- September temperatures averaged slightly below normal
 - Most of the state within 2 degrees of normal*

Percent of Normal Precipitation September 2008

- Most of Montana near to above normal
 - Isolated pockets northwest below normal
 - Most of southwest well below normal

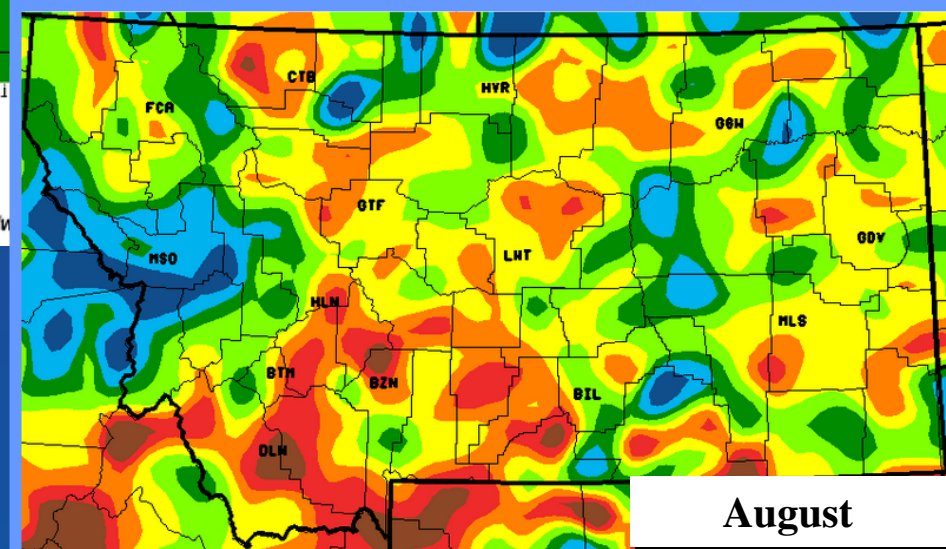


September 2008 Percent of Normal Precipitation
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

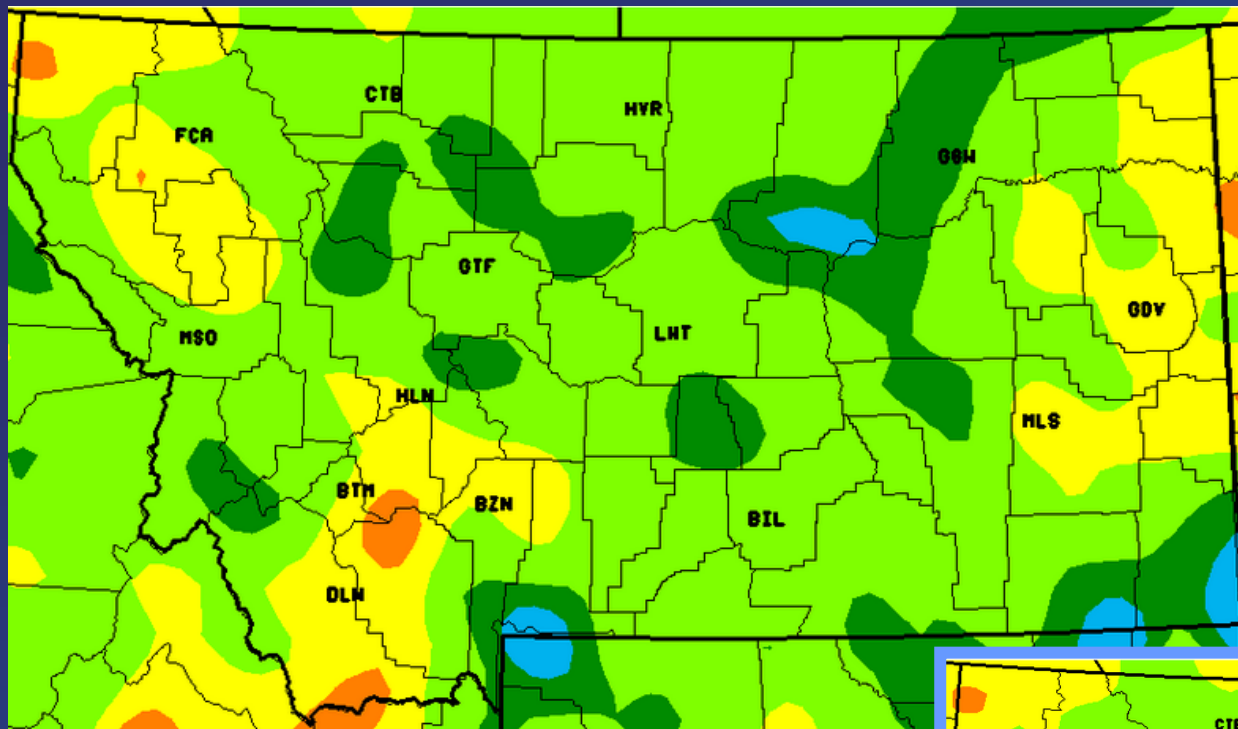
<http://www...>



August

Percent of Normal Precipitation Water Year 2008

- October – September
- Most of state ended Water Year near normal
 - Areas northwest, southwest and east below normal
 - Only isolated pockets well below normal



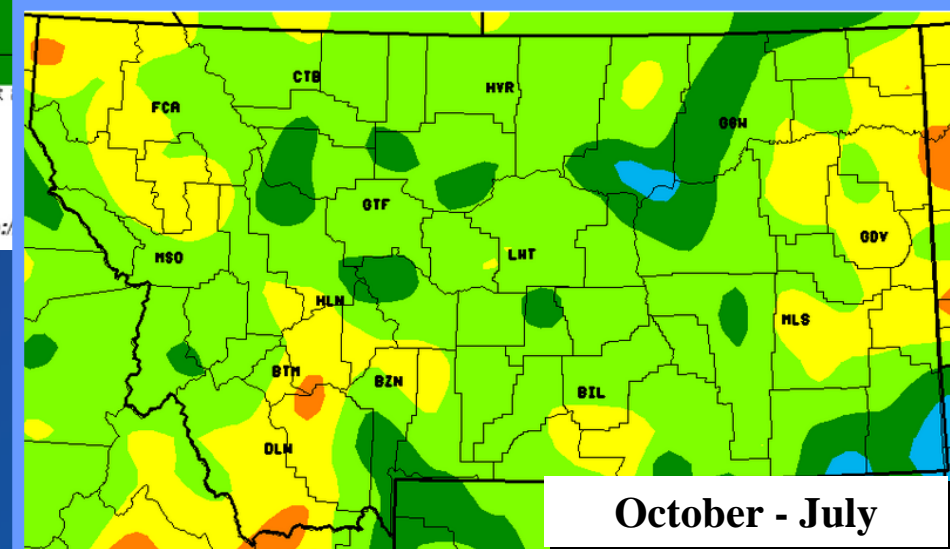
Oct 2007-Sep 2008 Percent of Normal Precipitation

Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://>

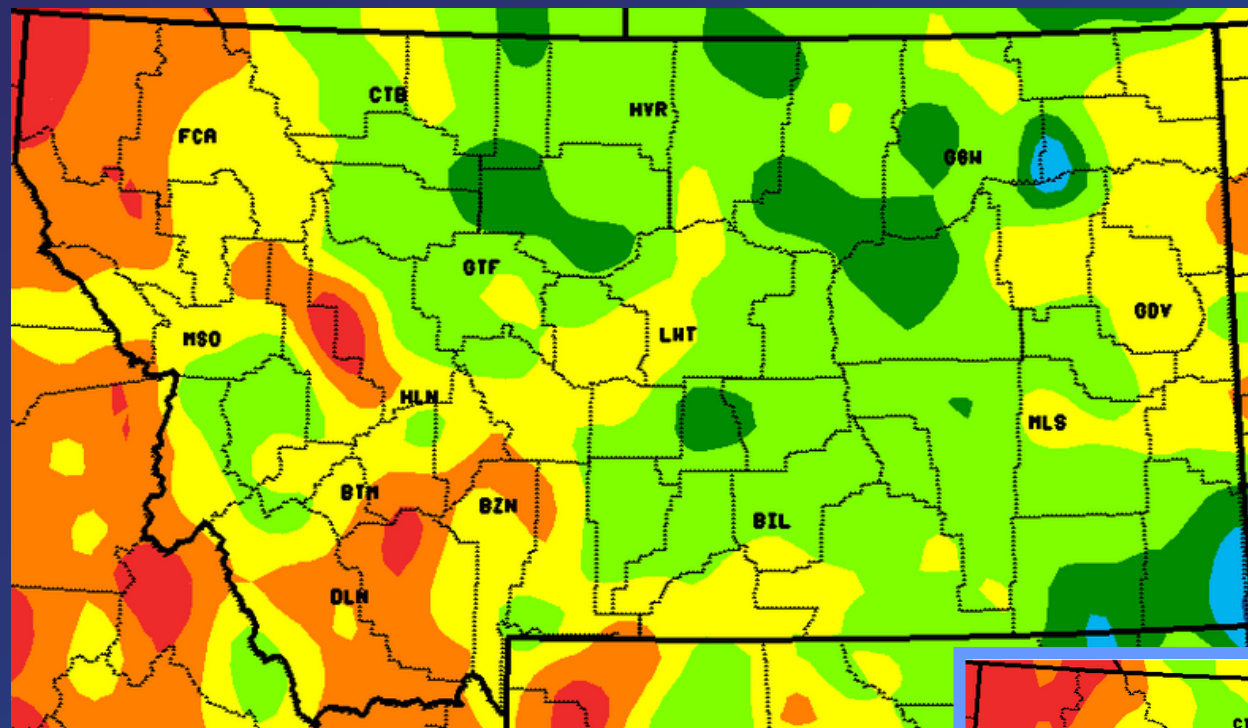


October - July

Percent of Normal Precipitation

Crop Year 2008

- April – September
- Areas west and southwest well below normal
 - Large areas 20% to 40% of normal
- Most of state east of divide near normal

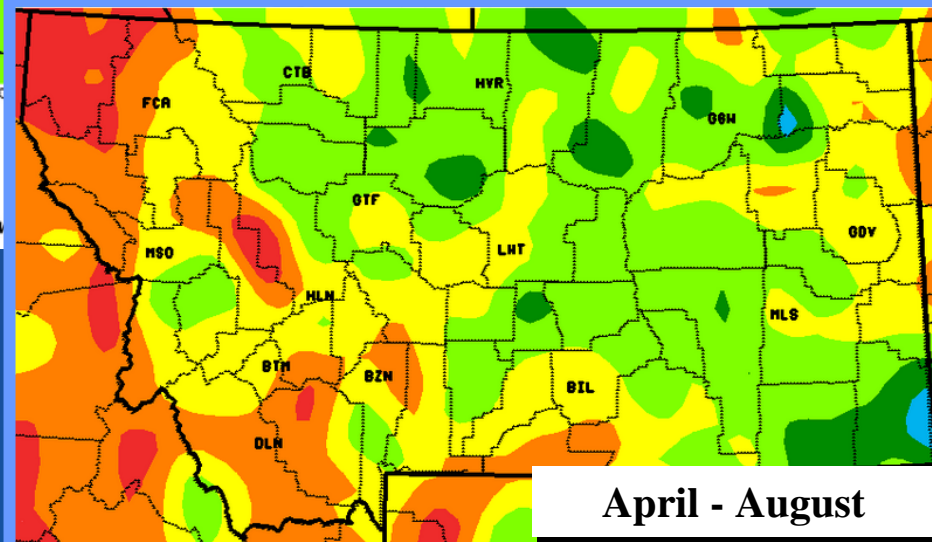


Apr-Sep 2008 Percent of Normal Precipitation
Period of Normal: 1971-2000

20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://v>



April - August

Departure from Average Temperature

October 1 – 13, 2008

- Temperatures slightly below normal overall
 - *Highs*
 - Near normal north
 - 2 to 8 degrees below normal central and south
 - *Lows*
 - Mostly near normal

High Temperatures

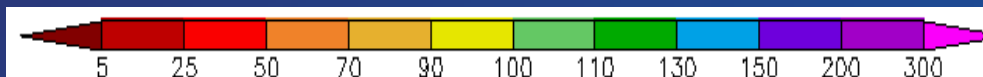
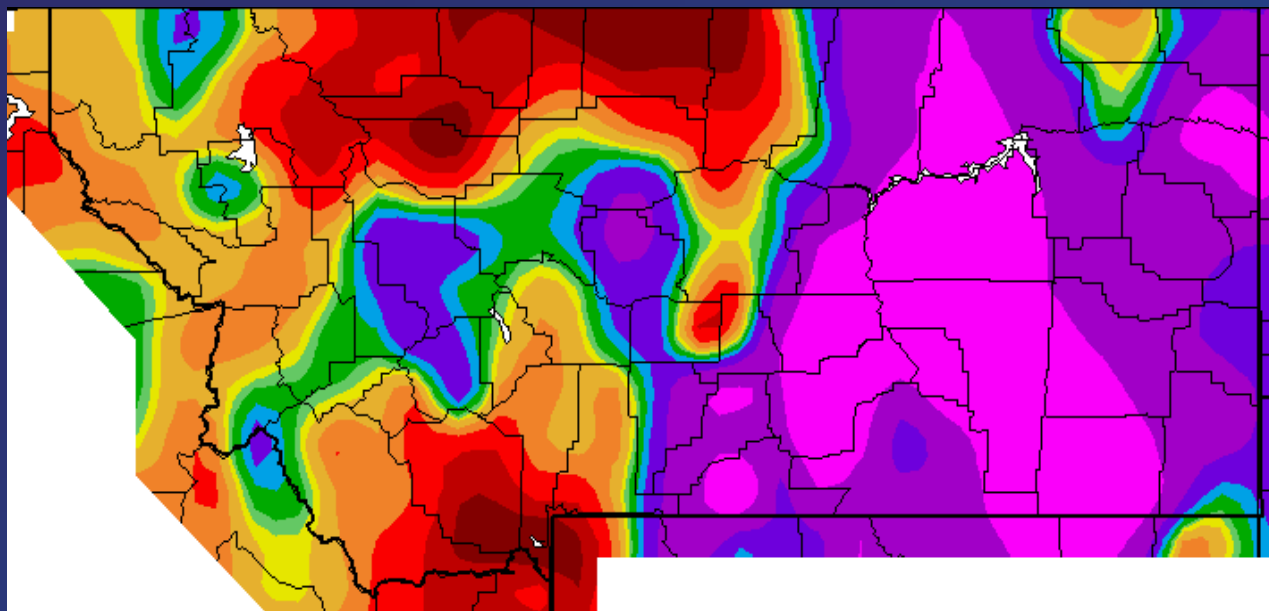
-10 -8 -6 -4 -2 0 2 4 6 8 10

Low Temperatures

-5 -4 -3 -2 -1 0 1 2 3 4 5

Percent of Average Precipitation

October 1 – 13, 2008



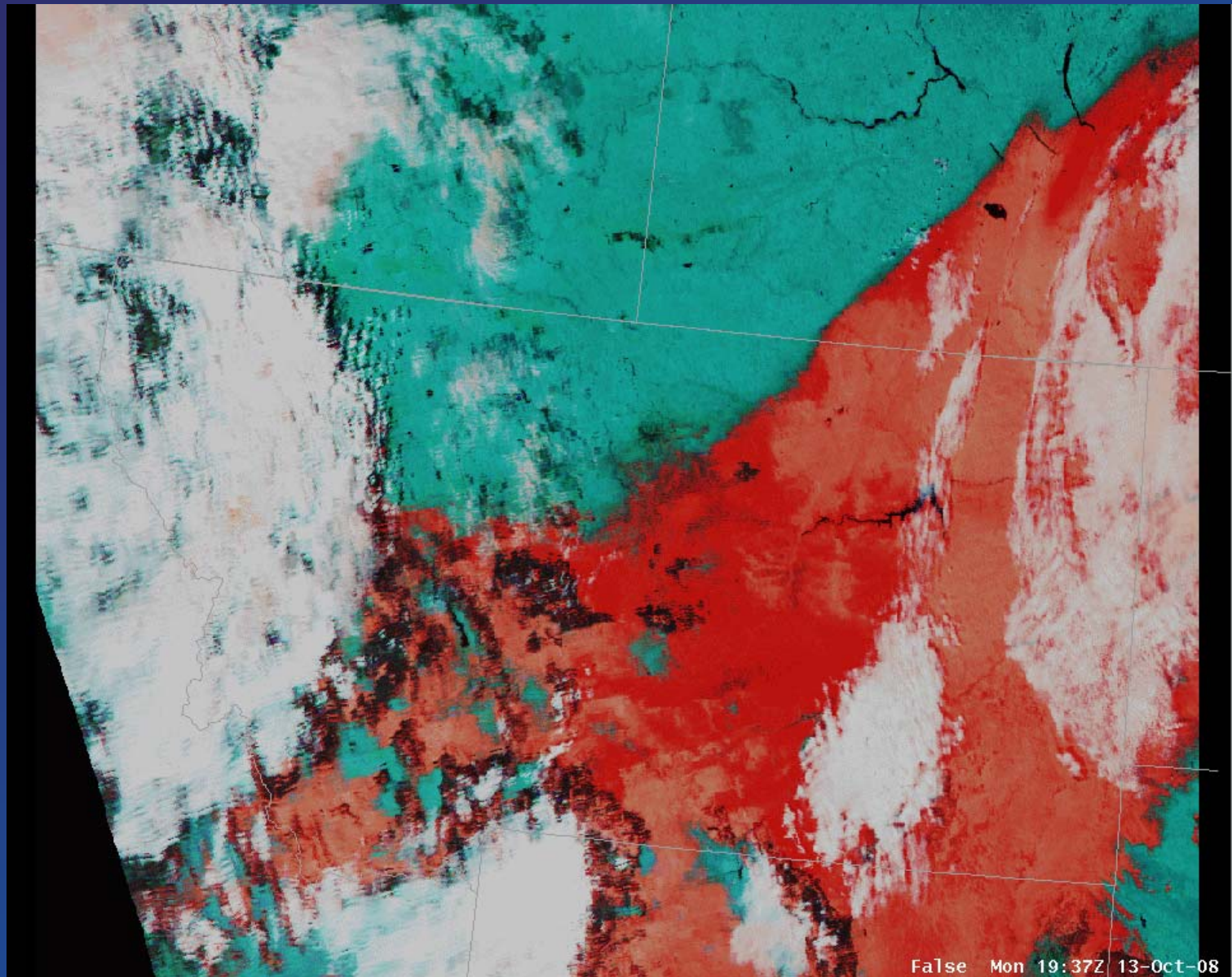
- Weekend storm brought record-breaking snowfall to central, southern and eastern Montana
 - Large portion of eastern Montana more than 300% of normal*
- West, north central and southwest below to well below normal



Snow in Stanford – Sunday, Oct 12, 9 am

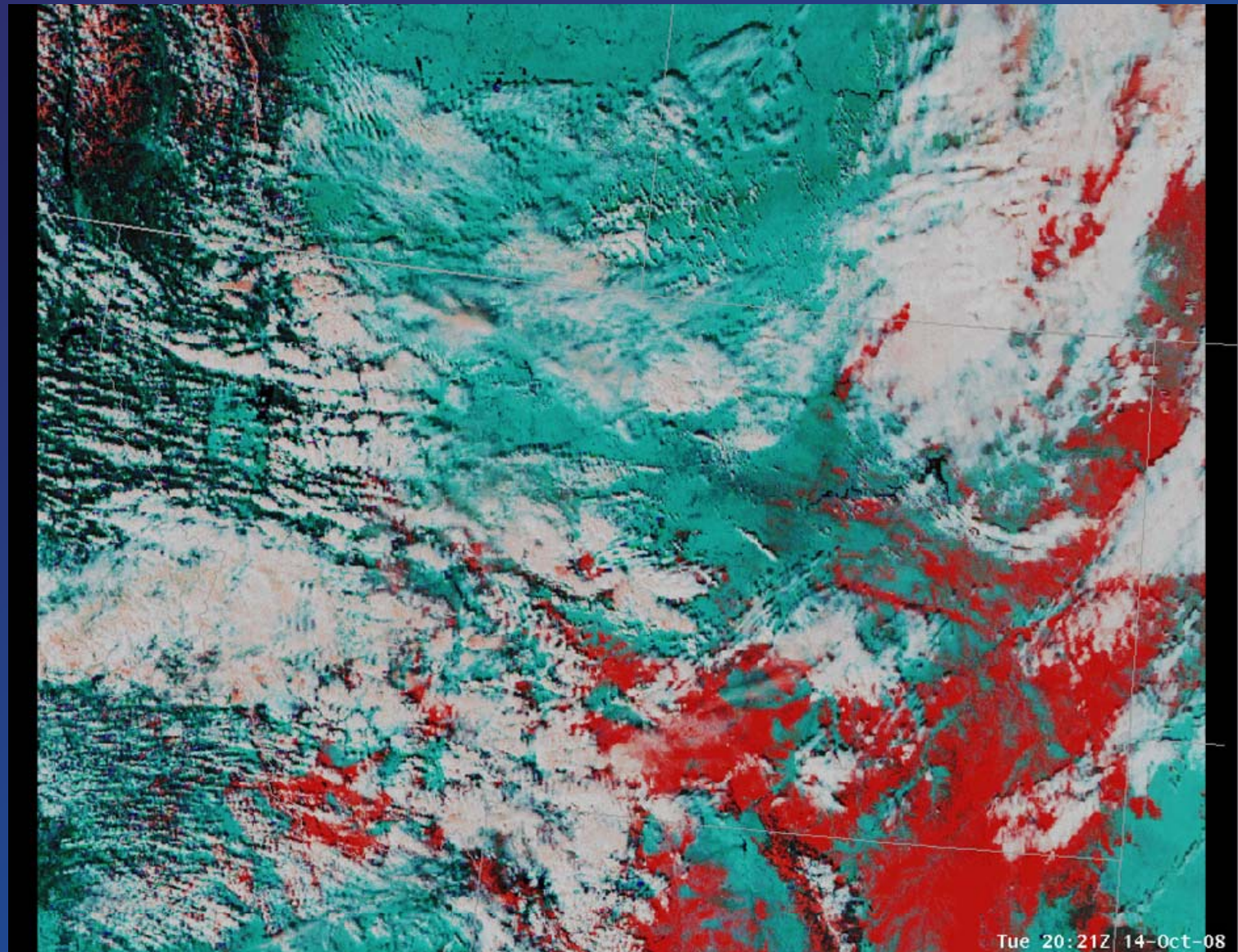
MODIS False-color Satellite Image

Monday, October 13, 2008



MODIS False-color Satellite Image

Tuesday, October 14, 2008



Significant Snowfall Totals

October 10 - 12, 2008

- ♦ **Albro Lake SNOTEL – Madison County – 62”**
- ♦ **Cole Creek SNOTEL – Carbon County – 49”**
- ♦ **Red lodge – Carbon County – 42”**
- ♦ **Nye – Stillwater County – 31”**
- ♦ **Half Moon Pass – Fergus County – 22”**
- ♦ **Big Sheep Mountains – Dawson County – 18”**
- ♦ **Billings area – Yellowstone County – 15-22”**
- ♦ **WFO Glasgow – Valley County – 14”**

Precipitation Totals

October and Water Year 2008

	ACTUAL PCPN	OCTOBER 1 - 13 NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	WATER YEAR TO DATE NRML PCPN	+/- NRML	% OF NRML
WESTERN MONTANA								
BUTTE	0.17	0.39	-0.22	44	0.17	0.39	-0.22	44
KALISPELL	0.19	0.39	-0.20	49	0.19	0.39	-0.20	49
MISSOULA	0.09	0.26	-0.17	35	0.09	0.26	-0.17	35
MULLAN PASS	1.26	1.43	-0.17	88	1.26	1.43	-0.17	88
SOUTHWEST MONTANA								
BIG SKY	0.18	0.65	-0.47	28	0.18	0.65	-0.47	28
BOULDER	0.43	0.26	0.17	165	0.43	0.26	0.17	165
BELGRADE FIELD	0.19	0.52	-0.33	37	0.19	0.52	-0.33	37
BOZEMAN MSU	0.66	0.73	-0.07	90	0.66	0.73	-0.07	90
DILLON AIRPORT	0.11	0.29	-0.18	38	0.11	0.29	-0.18	38
ENNIS	0.11	0.48	-0.37	23	0.11	0.48	-0.37	23
HELENA	0.33	0.27	0.06	122	0.33	0.27	0.06	122
ROGERS PASS 9 NNE	1.11	0.57	0.54	195	1.11	0.57	0.54	195
TOWNSEND	0.23	0.26	-0.03	88	0.23	0.26	-0.03	88
WISDOM	0.23	0.35	-0.12	66	0.23	0.35	-0.12	66

Precipitation Totals

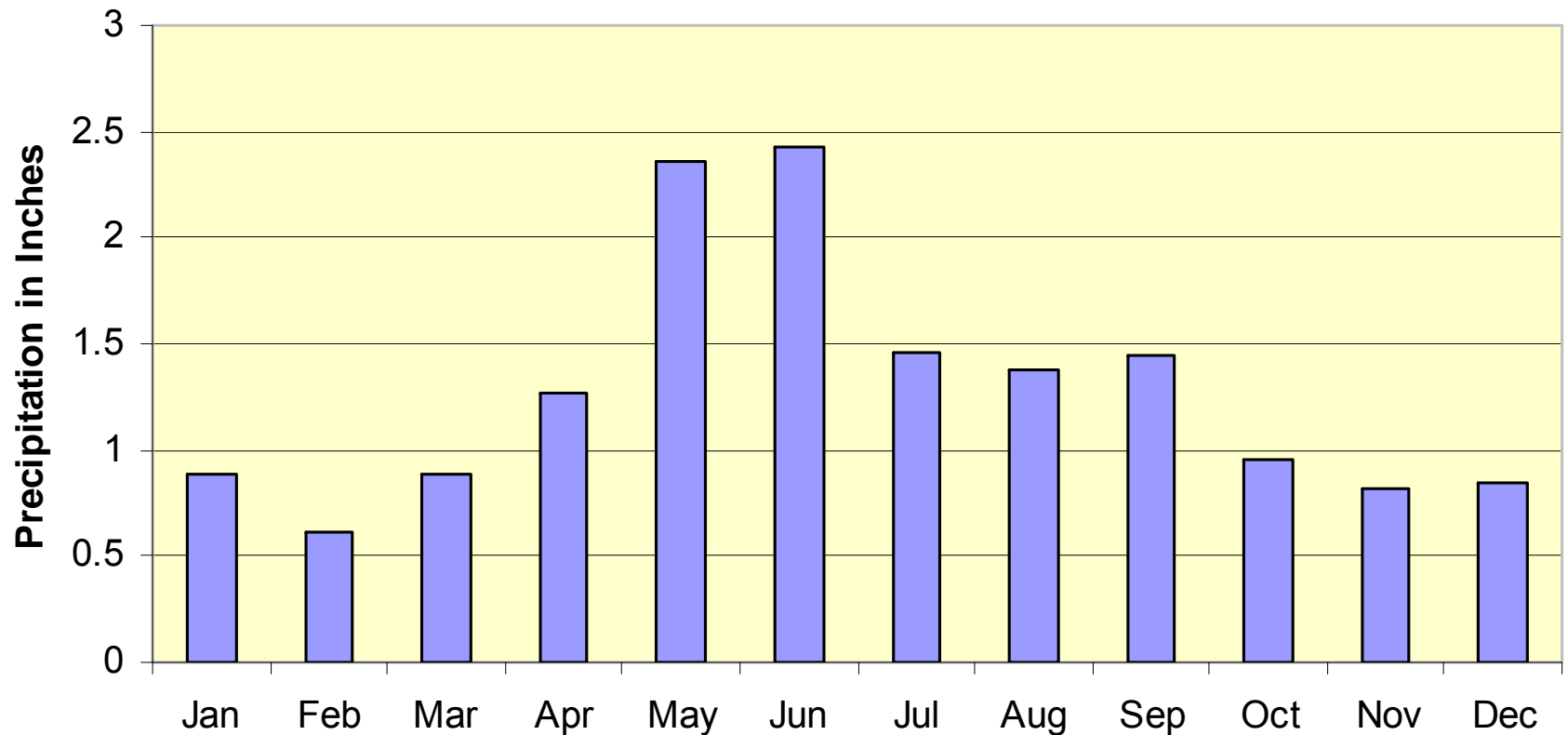
October and Water Year 2008

	OCTOBER 1 - 13				WATER YEAR TO DATE			
	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML	ACTUAL PCPN	NRML PCPN	+/- NRML	% OF NRML
CENTRAL MONTANA								
BILLINGS	1.68	0.59	1.09	285	1.68	0.59	1.09	285
CASCADE 20 SSE	0.02	0.46	-0.44	4	0.02	0.46	-0.44	4
CHESTER	0.00	0.26	-0.26	0	0.00	0.26	-0.26	0
CHINOOK	0.01	0.36	-0.35	3	0.01	0.36	-0.35	3
CHOTEAU	0.04	0.26	-0.22	15	0.04	0.26	-0.22	15
CONRAD	0.00	0.26	-0.26	0	0.00	0.26	-0.26	0
CUT BANK	0.07	0.27	-0.20	26	0.07	0.27	-0.20	26
FORT BENTON	0.18	0.39	-0.21	46	0.18	0.39	-0.21	46
GOLD BUTTE 7 N	0.00	0.38	-0.38	0	0.00	0.38	-0.38	0
GRASS RANGE	1.43	0.42	1.01	340	1.43	0.42	1.01	340
GREAT FALLS	0.44	0.41	0.03	107	0.44	0.41	0.03	107
HARLEM	0.22	0.33	-0.11	67	0.22	0.33	-0.11	67
HAVRE	0.01	0.29	-0.28	3	0.01	0.29	-0.28	3
LIVINGSTON	0.32	0.55	-0.23	58	0.32	0.55	-0.23	58
LEWISTOWN	0.48	0.52	-0.04	92	0.48	0.52	-0.04	92
MARTINSDALE 3 NNW	0.55	0.39	0.16	141	0.55	0.39	0.16	141
MILLEGAN	0.71	0.58	0.13	122	0.71	0.58	0.13	122
NEIHART 8 NNW	0.28	0.66	-0.38	42	0.28	0.66	-0.38	42
SHELBY	0.00	0.18	-0.18	0	0.00	0.18	-0.18	0
STANFORD	0.90	0.47	0.43	191	0.90	0.47	0.43	191
VALIER	0.04	0.28	-0.24	14	0.04	0.28	-0.24	14
WHITE SULPHUR SPRGS	0.19	0.49	-0.30	39	0.19	0.49	-0.30	39
EASTERN MONTANA								
GLASGOW	1.22	0.35	0.87	349	1.22	0.35	0.87	349
MILES CITY	1.48	0.52	0.96	285	1.48	0.52	0.96	285

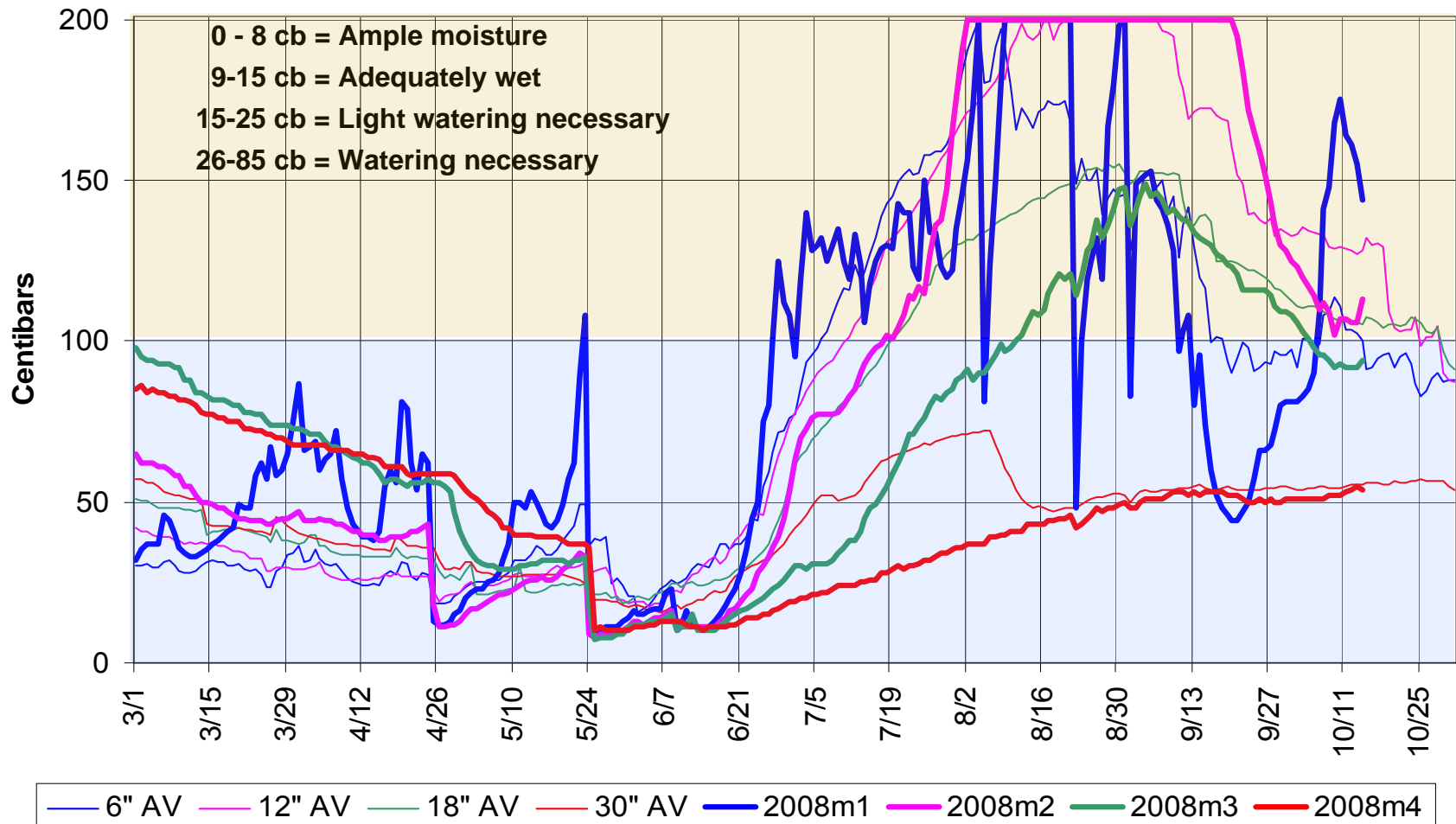
Statewide Average Precipitation

October is beginning of drier season...
also beginning of the Water Year

Statewide Average Precip



Great Falls Soil Moisture



- 6" moistening due to recent snow... still 'dry'
- Moistening at 12" and 18" with shut-off of plant growth
- 18" and 30" levels running slightly more moist than 2003-2007 average

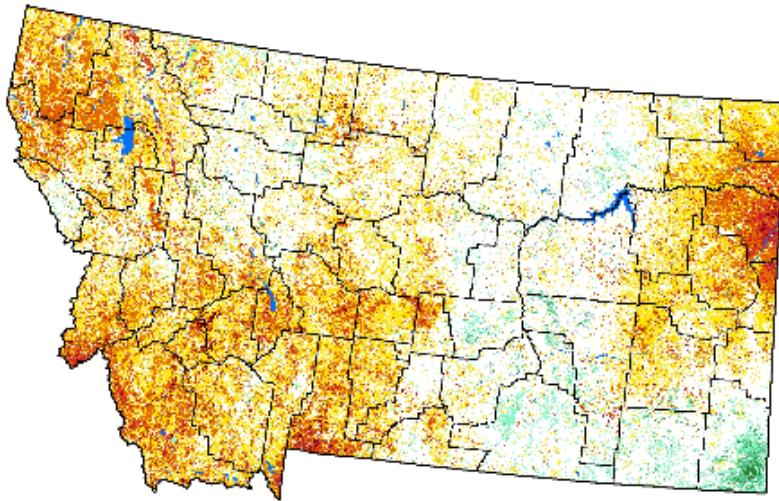
VegDRI Index

Vegetation Drought Response Index

Vegetation Drought Response Index
Complete: Montana

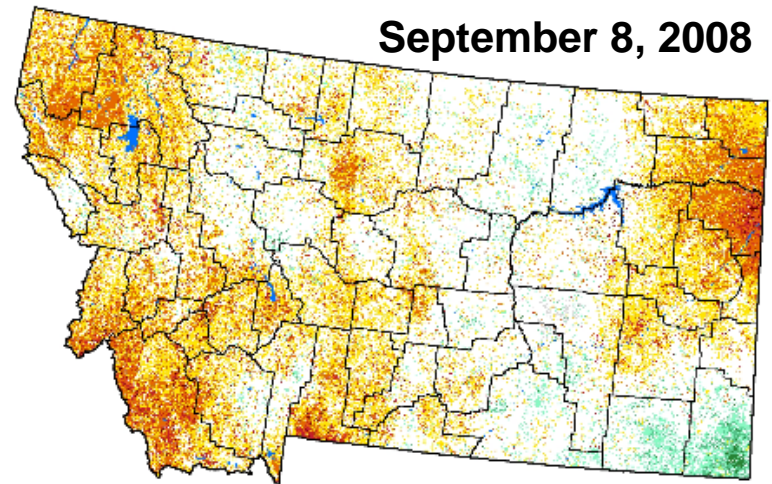
October 6, 2008

Vegetation Condition



💧 **Vegetation showing overall improvement as a result of recent series of storms**

September 8, 2008



- 💧 **VegDRI integrates satellite-based observations of**
 - Vegetation conditions
 - Climate data
 - Land cover/land use type
 - Soil characteristics
 - Ecological setting
- 💧 **Spatial detail 1-2 km resolution**

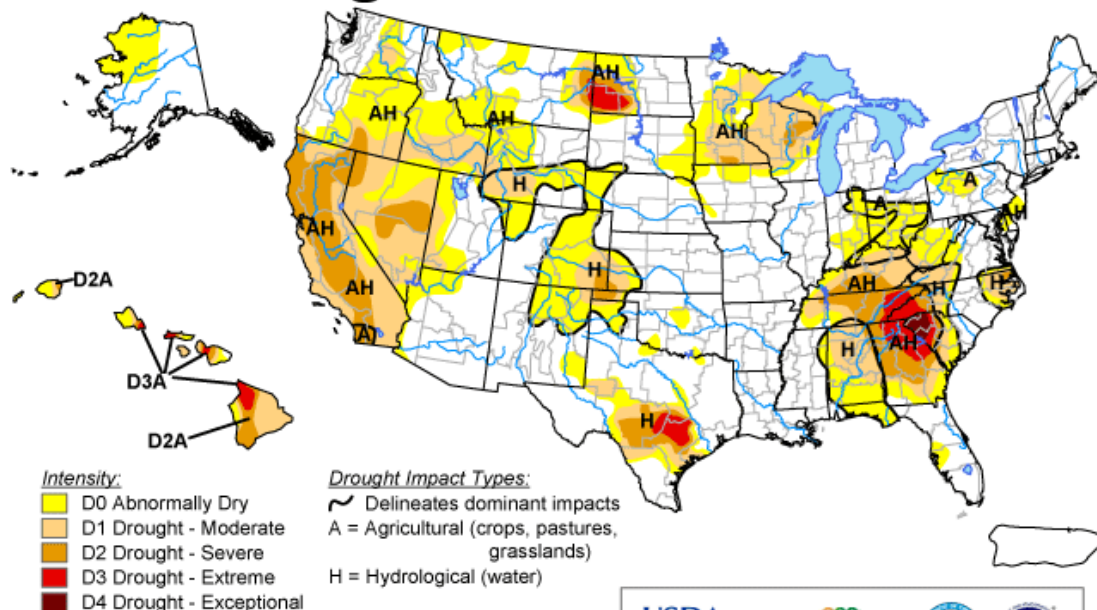
National Drought Monitor

Released October 7, 2008

U.S. Drought Monitor

October 7, 2008

Valid 8 a.m. EDT

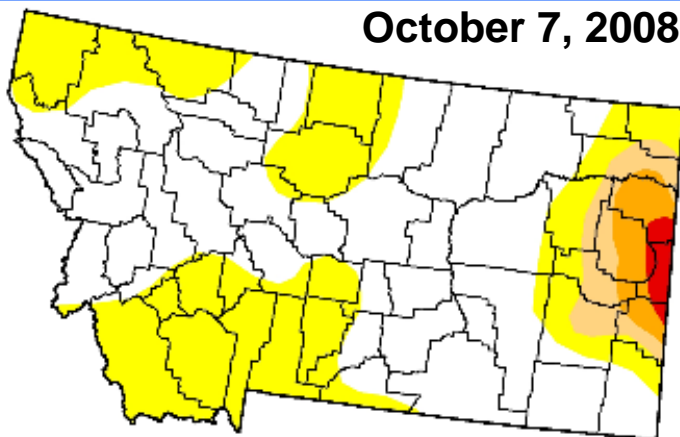


The Drought Monitor focuses on broad
Local conditions may vary. See accom
for forecast statements.

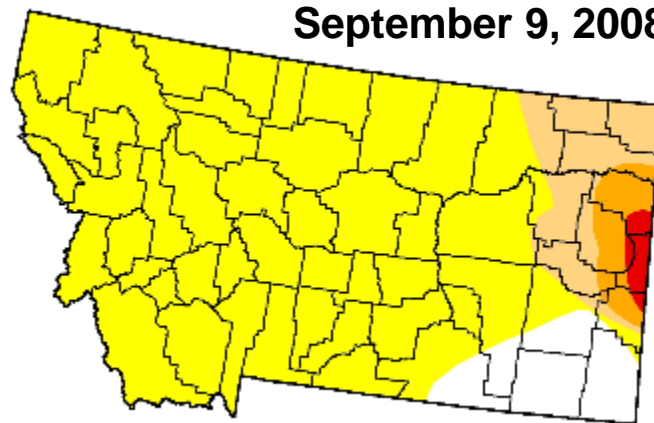
<http://drought.unl.edu/dm>

- D0 (Abnormally Dry) removed from large portions of west, central and eastern Montana
- Areas of D2 (Severe) and D3 (Extreme) still remain along North Dakota border

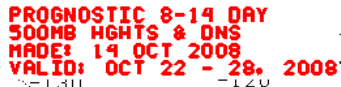
October 7, 2008



September 9, 2008



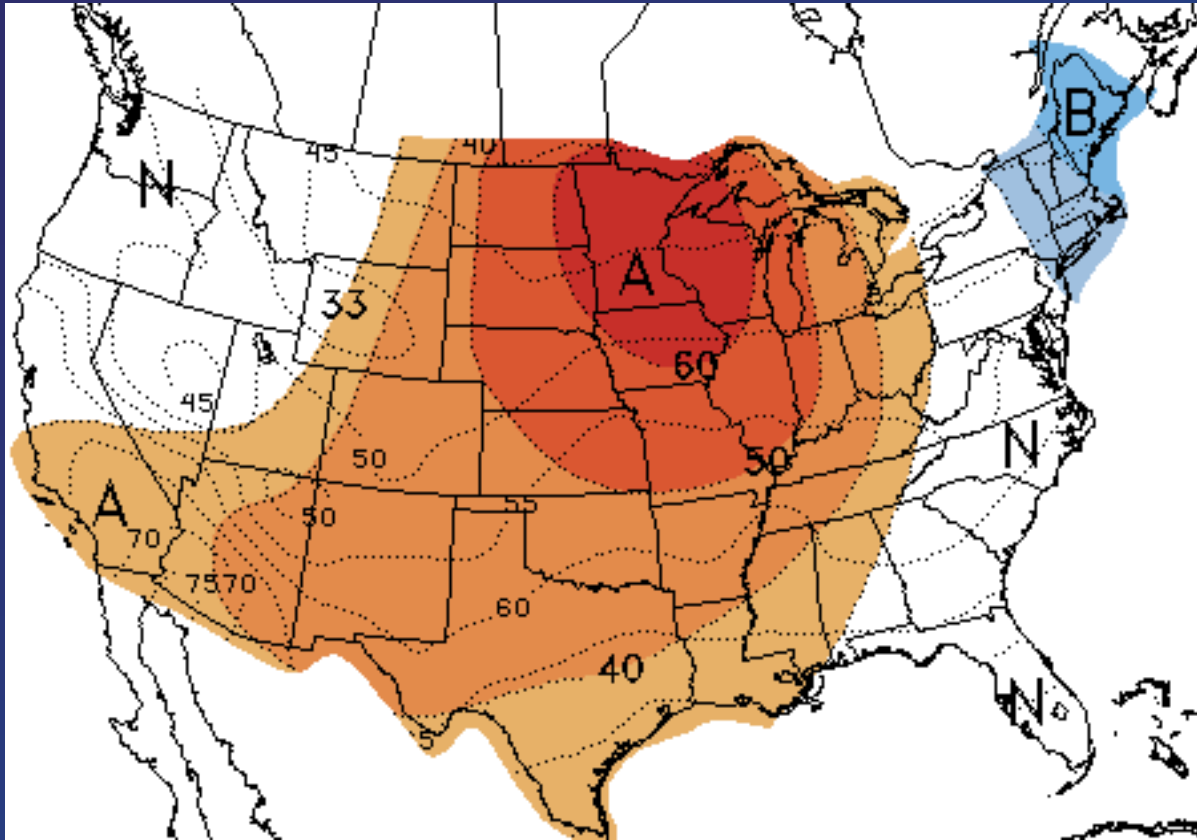
500mb Heights and Anomalies



**HIGHTS AND DNS (DASHED)
AT 60M INTERVALS**

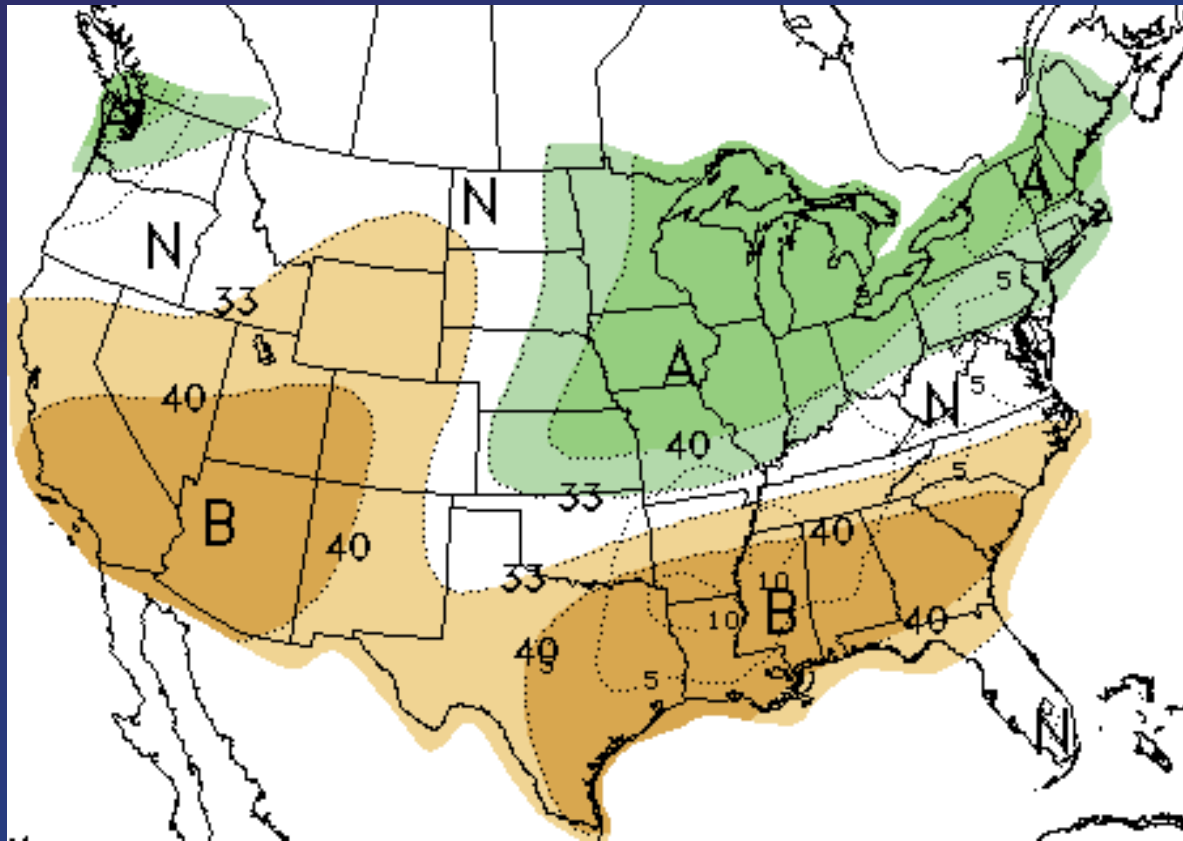
- 🔹 **October 22 - 28**
- 🔹 **Weak high pressure ridge centered near western Montana**

8 to 14 Day Outlook – Temperatures



- October 22 - 28
- Eastern Montana has better chance for above normal temperatures
 - 33% to 50% chance
- Western and central Montana have equal chances for above, below or near normal temperatures
- Averages
 - *Highs in the mid 40s and 50s*
 - *Lows in the mid 20s to lower 30s*

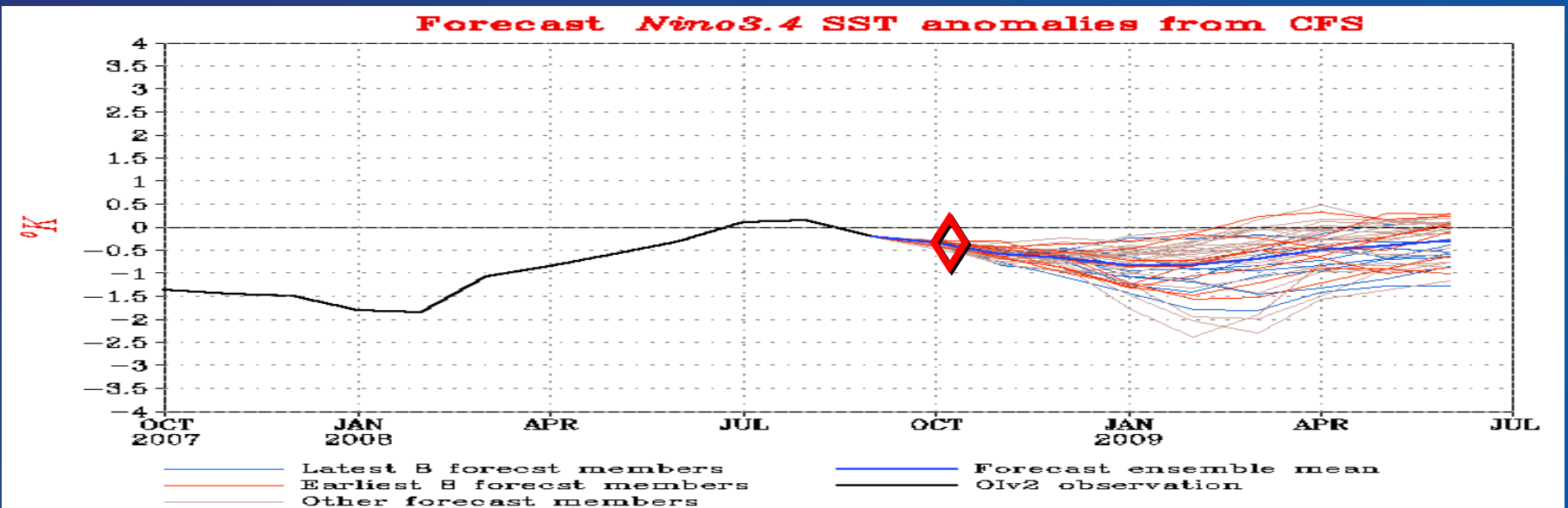
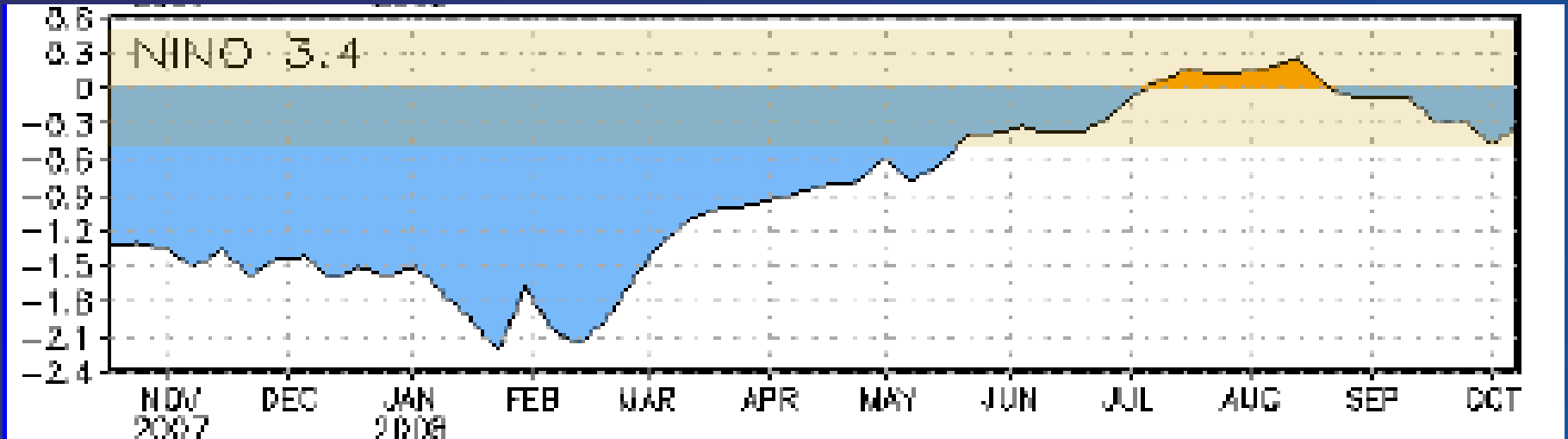
8 to 14 Day Outlook – Precipitation



- October 22 - 28
- Southern Montana has better chances for below normal precipitation
 - 33% to 40% chance
- Remainder of state has equal chances for above, below or near normal precipitation
- Normals
 - ~0.50 – 1.25 inches

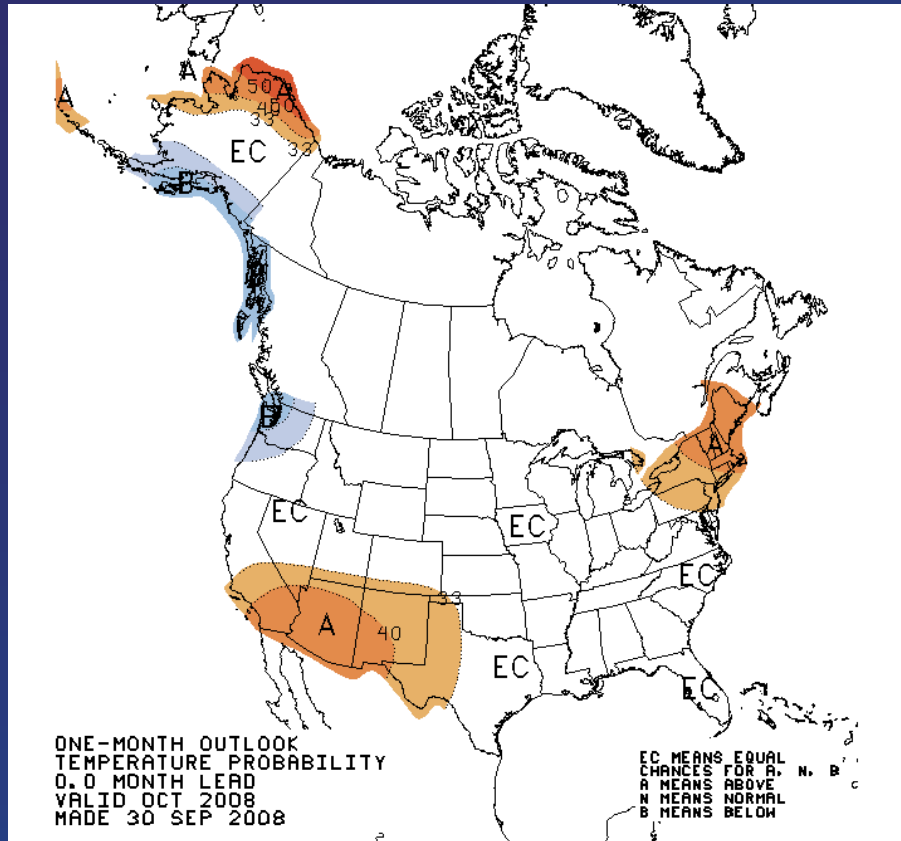
El Niño / La Niña

- ENSO-neutral conditions are expected to continue into early 2009
- Majority of forecasts indicate ENSO-neutral conditions through spring 2009



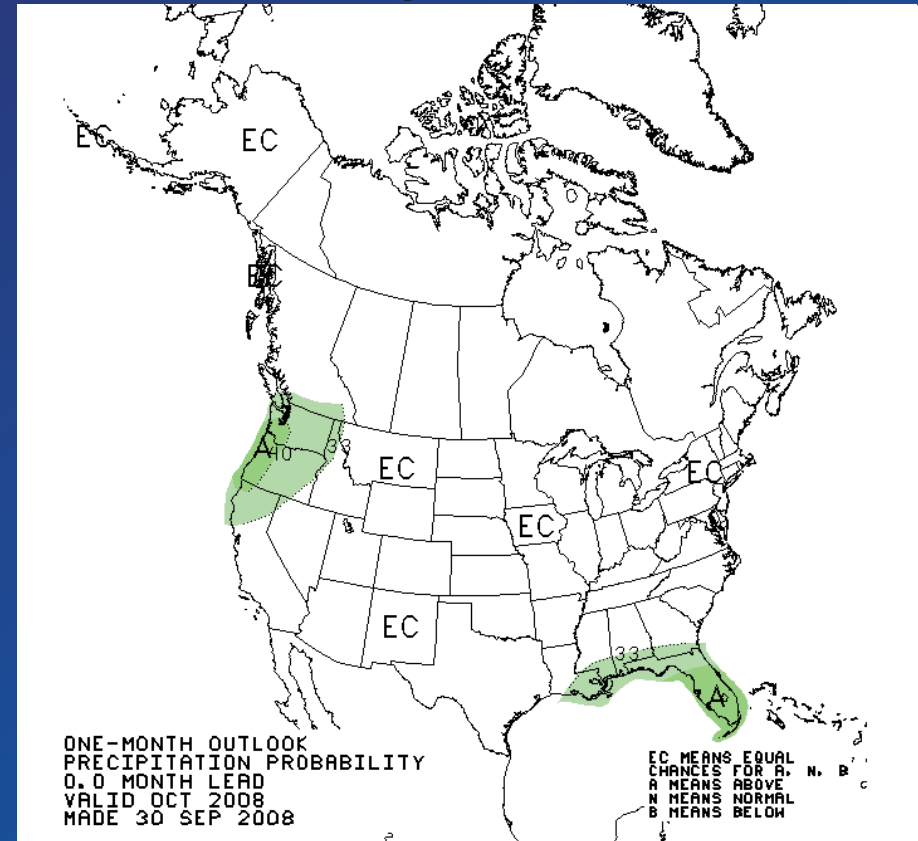
October Outlook

Temperature



- Equal chances temperatures will be above...below or near normal across Montana

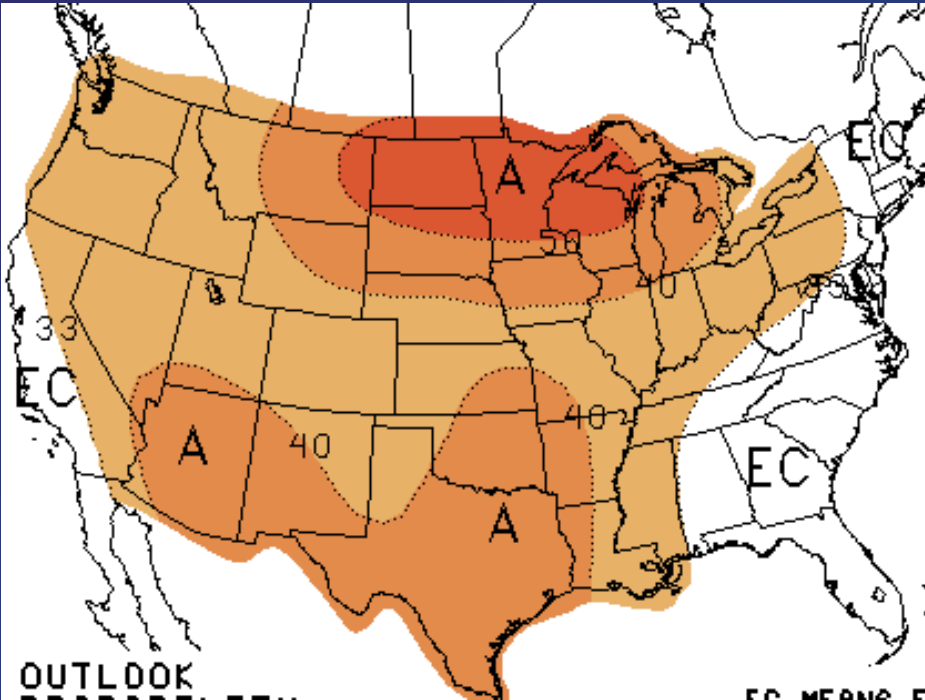
Precipitation



- Equal chances precipitation will be above...below or near normal across Montana

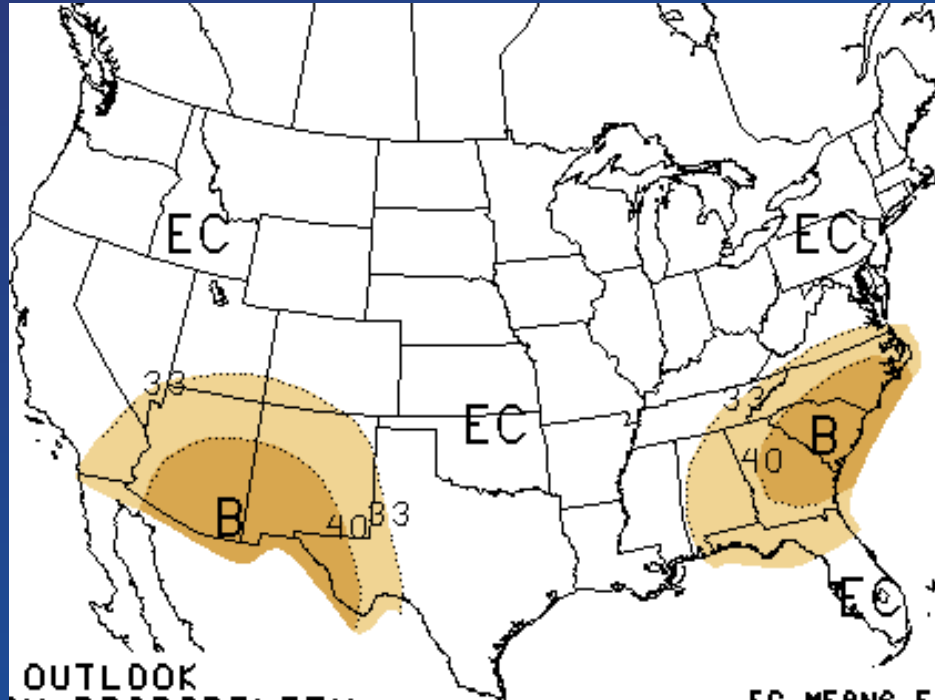
November - January Outlook

Temperature



- 33% to 40% chance temperatures will be above normal over western Montana
- 40% to 60% chance temperatures will be above normal over central and eastern Montana

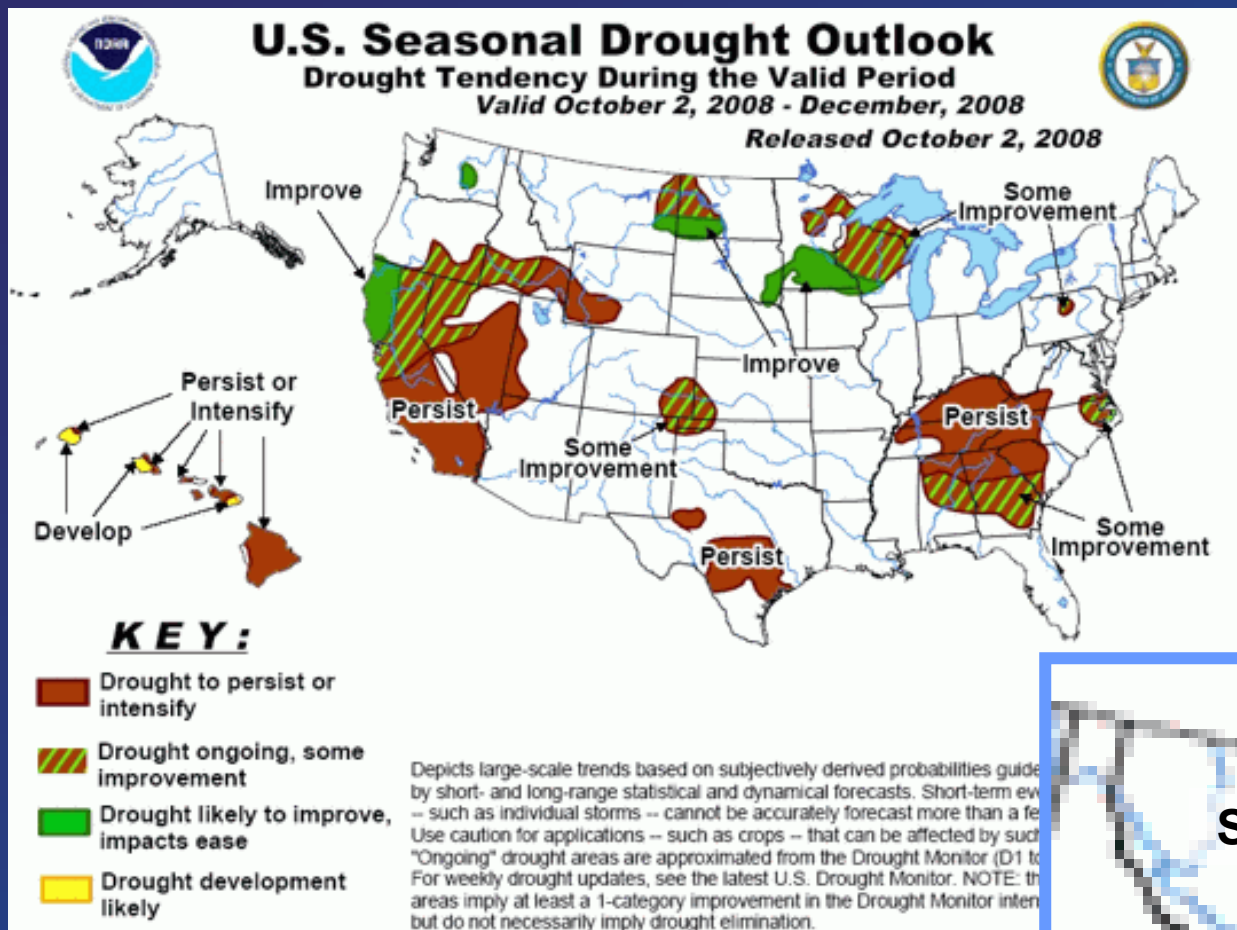
Precipitation



- No forecast skill... equal chances precipitation will be above... below or near normal across Montana

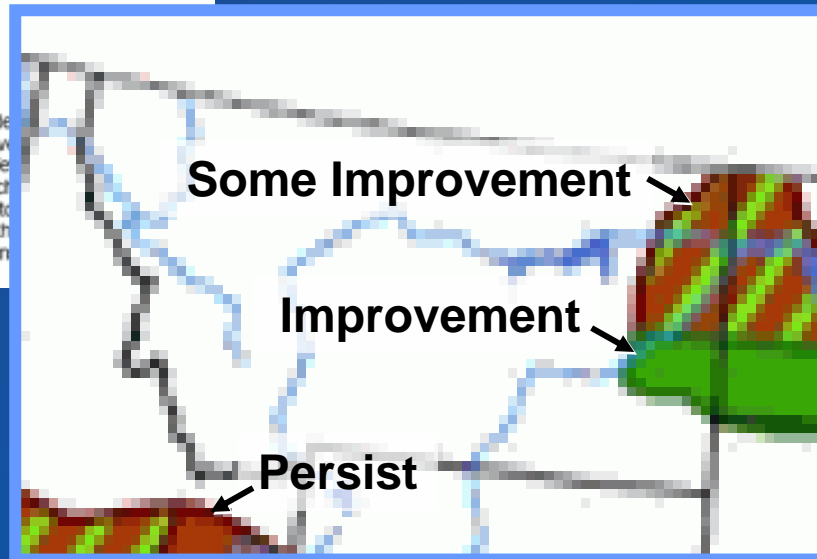
Drought Outlook

Issued October 2, 2008



Some improvement expected along North Dakota border

Zoomed to Montana



In Summary...

- 💧 September brought near to above normal precipitation to much of Montana
 - *Exception was southwest which was well below normal*
- 💧 October has seen a series of weather systems move through... including one significant snow storm last weekend
 - *Much of eastern Montana at more than 300% of normal for the month so far*
- 💧 Water year 2008 ended with most of the state near normal
 - *Exceptions were northwest, southwest and east which ended below normal*
- 💧 Crop year shows west, southwest and eastern Montana to be below normal
 - *North central, central and south central near to slightly above normal*
- 💧 Current Drought Outlook indicates some improvement expected east

weather.gov

weather.gov/billings

weather.gov/glasgow

weather.gov/missoula

weather.gov/greatfalls



Missouri River near Cascade